

**REMARKS/ARGUMENTS**

Claims 1-4, 10-29, 40-69, and 71-88 were pending in the application of which claims 1, and 67 were independent claims. Claims 10-19, 22-28, 40-69, 71-78, 80-86, and 88 have been withdrawn. Claims 1-3, 20, and 87 have been amended. Accordingly, claims 1-4, 20-21, 29, 79, and 87 are still pending of which claim 1 is an independent claim.

**Objections to the specification:**

Paragraph 3 of the Action objects to the amendment of November 3, 2008 under 35 U.S.C. 132(a) for allegedly introducing new matter into the specification. Claim 3 has been amended above. Support for the amendment can be found for example in the description of steps 104 and 332. Applicant therefore believes that the objection is moot, and respectfully requests withdrawal of the objection.

Paragraph 4 of the Action includes an objection to the specification under 37 C.F.R. 1.71 for allegedly failing to disclose how one of skill in the art is to specify optimum golf equipment based on loft [031], load time [045], load pattern [039] to [043], shaft length, shaft materials, shaft torque, shaft weight, different grips, different grip weights [060], tip size [069], head center of gravity, ball, and head type [056]. Applicant addressed this objection in the last response and is not sure that such a rejection is appropriate since it does not seem to related to any particular claim limitation. Accordingly, Applicants respectfully request withdrawal of the objections of paragraph 4.

**Claim Rejections Under § 112:**

Paragraph 7 of the Action rejects claims 2-4 and 20-21 under 35 U.S.C. 112, first paragraph, for allegedly failing to comply with the enablement requirement.” With respect to claim 2, Applicant has amended claim 2 to more clearly define the invention. Support for the amendment can be found, e.g., at paragraphs 28-33. Accordingly, Applicant believes that this rejection is moot. With respect to claim 3-4, Applicant has amended claim 3 to more clearly define the invention. Accordingly, Applicant believes that this rejection is moot

With respect to claims 20-21, figure 3 illustrates a process whereby various aspects of a golf club can be iteratively changed in order to achieve an optimum ball flight. What constitutes an optimum ball flight is discussed, e.g., in paragraphs 54, 57, and 58. The grip is one of the aspects that can be changed (step 320). Thus, it is clear that if optimal launch conditions are not achieved yet, then the grip is one aspect that can be changed, launch data can be gathered for the new grip, and determination made as to whether the launch data produced with the new grip achieves the optimum ball flight as specified, e.g., in paragraphs 54, 57, and 58. If the optimum launch data is achieved, then obviously the golfer would be told to obtain a club with that grip.

For at least the above reasons, Applicants believe that claims 2-4 and 20-21 are enabled. Accordingly, Applicants respectfully request withdrawal of the rejection of claims 2-4 and 20-21.

Paragraph 9 rejects claims 2-4 under 35 U.S.C. 112, second paragraph, as allegedly being indefinite. Claims 2 and 3 have been amended thereby rendering this rejection moot. Applicant therefore respectfully request withdrawal of the rejection.

**Claim Rejections Under § 103:**

Paragraph 11 of the Action rejects claims 1, 29, and 79 under 35 U.S.C. §103(a) as allegedly being obvious over Anderson (U.S. Patent Publication 2003/0008731) in view of Gobush (U.S. Patent No. 6,758,759) in further view of Evans (U.S. Patent No. 3,792,863). Applicants respectfully traverse the rejection because Anderson in further view of Gobush and Evans fails to make out a *prima facie* case of obviousness.

To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on Applicant's disclosure. *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991).

In order to allege a claim is obvious when references are combined under 35 U.S.C. 103(a) the combination must teach each and every limitation of the claim. In this case, the rejection must fail because Anderson, Gobush, and Evans alone or in combination, fail to teach each and every element of the claims as amended. Moreover, the references actually teach away from the claimed combinations and fail to provide any motivation to combine the references in a manner that would render the claims obvious.

For example, certain embodiments of the present application are directed to a method for fitting a golfer with a golf club in which a baseline configuration of club

head, shaft, grip, and ball are used and the results of using the baseline configuration are monitored. (See, e.g., the description of figure 2 in the present application). In particular, swing data such as a load time and load pattern can be used to select, e.g., a shaft flex for the baseline configuration. (See, e.g., see paragraph 45). The monitoring can include monitoring of launch information such as launch angle, velocity, and spin. (See, e.g., paragraph 52). The monitored information can then be used to, e.g., select at least one of a new golf shaft or club head in order to optimize the velocity, spin, and launch angle relative to each other. (See, e.g., paragraphs 52-56).

More specifically, the embodiments described in the present application disclose a method in which a load time, load pattern, ramp potential, etc., are used to determine whether the golfer's swing technique should be modified. For example, as described in paragraphs 39 to 43, various load patterns can be detected and used to identify swing flaws. The swing flaws associated with the load patterns can then be used to suggest changes in swing technique. Once the golfer's load pattern more closely resembles a proper incline load pattern, then the swing parameters, e.g., load time, load pattern, ramp potential, etc., can be used to specify a shaft flex for use in further fitting the golfer with golf equipment. (See paragraph 45).

As described with respect to figure 3, a golf club can then be selected or assembled (paragraphs 60 to 662) that includes a shaft flex, e.g., determined based on the swing data. The golf club can then be swung by the golfer and launch data can be obtained. The launch data, i.e., velocity, spin rate, and launch angle, can then be used to fine tune the shaft flex determination (paragraph 54) as well as to specify other club aspects. For example, as described in paragraphs 54 to 63 various aspects of the club can

be changed until an optimum ball flight is achieved as indicated by the launch data. Once an optimum ball flight is achieved, then the final parameters can be used to specify a golf club optimized for the golfer. (See paragraph 64).

What constitutes optimum ball flight can vary based, e.g., on the club being swung. For example, for a driver an optimum ball flight can be defined as one that achieves the greatest distance, while maintaining control and consistency. (See paragraph 54). For irons, the key is not distance as much as a tight dispersion and consistent distance gaps from one iron to the next, while still maintaining control and consistency. (See paragraph 57). For wedges, maximizing spin or launch angle can be more optimum. (See paragraph 58).

But as described, whereas one golfer may need to increase spin to, e.g., increase distance with a driver, another may need to decrease spin, even if, e.g., they have the same swing speed. For example, the two golfers may produce different launch angles, which can effect the distance. (See, e.g., paragraph 56). Moreover, two different golf clubs, fitted with the same parameters, e.g., shaft stiffness, can produce different results when swung by the same golfer. (See, e.g., paragraph 55). Further, e.g., different tip sections of equal flex shafts can have a dramatic effect.

Thus, in order to fit a particular golfer with optimum golf equipment for them, various aspects of the golf club must be changed and tested to determine their effect on the ball flight produced. (See description of figure 3). And more importantly, it is not a simple matter of, e.g., maximizing speed in order to gain distance. Rather, an optimum combination of spin rate and launch angle must still be determined, then a maximum swing speed for the optimum combination of spin rate and launch angle can be

determined, while ensuring that control and consistency are not sacrificed. (See paragraph 54). As a result, non-linear relationships between the launch angle, velocity, and spin rate must be used in order to avoid the mistake of conventional fitting processes, which simply look at the velocity, or swing speed and then use direct linear relationships to select a launch angle and spin rate based on the velocity. (See paragraph 86).

In general, figures 1-3, and specifically figure 3, and the accompanying description depicts and describes a process in which the various club aspects that effect speed, spin, and launch angle can be alternately and repetitively changed and then tested to see their effect on the ball flight, always with an optimum ball flight to be achieved in mind. Once the optimum ball flight is achieved using a particular set of club parameters and based on the non-linear relationships, then that set of parameters can be used to specify a golf club that comprises those parameters. (See paragraph 64).

Accordingly, claim 1 is directed to a two part process. The first part comprising “collecting data related to how the golfer swings a golf club, the golf club comprising a shaft and a club head, the swing data comprising a load time, load pattern, peak load, swing ramp, and ramp potential or a combination of at least some of these parameters, determining if the golfer's swing technique should be modified based at least in part on the collected swing data when it is determined that the golfer's swing technique should be modified, then using the swing data to correct the swing flaws.” The second part comprising “when it is determined that the golfer's swing technique should not be modified, then in a launch module, monitoring how the golfer launches a golf ball using the golf club by obtaining launch data from a launch monitor including a launch angle, velocity, and spin rate; in the launch module, using the received launch data to optimize a

launch angle, velocity, and spin rate relative to each other based on non-linear relationships between the launch angle, velocity, and spin rate; iteratively changing a combination of characteristics of at least one of the shaft and the club head until the optimized launch angle, velocity, and spin rate are achieved; and in the launch module, obtaining launch data from the launch monitor related to how the golfer launches a golf ball using the golf club with the changed characteristics.”

Conversely, Anderson, Gobush, and Evans, alone or in combination, fail to teach such optimization. Anderson is directed to a fitting process the specific goal of which is to fit a golfer for golf equipment based on their specific swing type, i.e., swing flaws included. (See the Abstract, Field of the Invention, and paragraphs 4, 34, 50, and 51). In fact, in paragraph 48 Anderson expressly distinguishes his system from systems in which the swing data is used to improve a golfer’s swing, i.e., the purpose of the embodiments disclosed in Anderson are not to correct a golfer’s swing, but rather to provide a quick, automated manner in which to fit a golfer for their swing type, i.e., with their swing flaws. (See paragraph 51). This is the antithesis of what is taught and described in the present application.

In short, Anderson simply teaches quickly collecting certain swing data and then quickly specifying club characteristics based thereon. Anderson is not concerned with achieving an optimum ball flight and does not teach changing certain club aspects in order to achieve an optimum ball flight by changing the velocity, spin, and launch angle.

As directed by MPEP §2143.01(V), “[i]f proposed modification would render the prior art invention being modified unsatisfactory for its intended purpose, then there is no suggestion or motivation to make the proposed modification. *In re Gordon*, 773 F.2d

900, 221 USPQ 1125 (Fed. Cir. 1984).” Accordingly, Applicant respectfully asserts that since Anderson is explicitly directed to a fitting process in which a golfer’s technique is not modified, then any proposed modification that includes fixing the golfer’s technique would render Anderson unsatisfactory for its intended purpose. Here, the Office Action proposes modifying Anderson with the teachings of Gobush and Evans to provide “collecting data related to the golfer’s swing, the swing data comprising a load time, load pattern, peak load, swing ramp, and ramp potential or a combination of at least some of these parameters, determining if the golfer’s swing technique should be modified based at least in part on the collected swing data when it is determined that the golfer’s swing technique should be modified, then using the swing data to correct the swing flaws.” However, since this proposed modification includes fixing the golfer’s technique, there is no suggestion or motivation to make the proposed modification to Anderson based upon the teachings of Gobush and Evans. Thus, Applicant respectfully asserts that the Office Action fails to establish a *prima facie* case of obviousness.

As directed by MPEP 2143.01(VI), “[i]f proposed modification or combination of the prior art would change the principle of operation of the prior art invention being modified, then the teachings of the references are not sufficient to render the claims *prima facie* obvious. *In re Ratti*, 270 F.2d 810, 123 USPQ 349 (CCPA 1959).” Accordingly, Applicant respectfully asserts that since Anderson explicitly requires that there be no modification of swing technique, then any proposed modification that results in a modification of swing technique would change the principle operation of Anderson. Here, the Office Action proposes modifying Anderson with the teachings of Gobush and Evans to provide “collecting data related to the golfer’s swing, the swing data comprising

a load time, load pattern, peak load, swing ramp, and ramp potential or a combination of at least some of these parameters, determining if the golfer's swing technique should be modified based at least in part on the collected swing data when it is determined that the golfer's swing technique should be modified, then using the swing data to correct the swing flaws.” However, since this proposed modification includes fixing the golfer's technique, there is no suggestion or motivation to make the proposed modification to Anderson based upon the teachings of Gobush and Evans, then Applicant respectfully asserts that the Office Action fails to establish a *prima facie* case of obviousness.

It should also be noted that the Action's characterization of Evans is mistaken. Evans does not teach or suggest using the swing data to correct swing flaws or to determine appropriate modifications to the golfer's swing to produce an incline pattern. In support, the Action simply cites figure 2 and the entirety of column 4, which is the description of this figure. But no where in column 4 does Evans state that the swing data can be used to correct the golfer's technique. What it does state, and which is consistent with conventional fitting processes, is that the data can be used to select a shaft stiffness, or a club head size. (See col. 4, lines 62-67). This approach is typical of conventional fitting processes, i.e., the golfer's swing speed is assessed and used to specify equipment.

In general, and as noted in more detail below, the Action fails to consider that club makers at the time of the invention operated under a narrow set of assumptions about how clubs work and what the best combination of parameters would be: namely, that there is a fixed relationship between the speed at which a golfer swings a club and each of, e.g., the stiffness, launch angle, and spin rates.

With respect to the second part of the claimed process in amended claim 1, i.e., “when it is determined that the golfer's swing technique should not be modified, then in a launch module, monitoring how the golfer launches a golf ball using the golf club by obtaining launch data from a launch monitor including a launch angle, velocity, and spin rate; in the launch module, using the received launch data to optimize a launch angle, velocity, and spin rate relative to each other based on non-linear relationships between the launch angle, velocity, and spin rate; iteratively changing a combination of characteristics of at least one of the shaft and the club head until the optimized launch angle, velocity, and spin rate are achieved; and in the launch module, obtaining launch data from the launch monitor related to how the golfer launches a golf ball using the golf club with the changed characteristics,” Applicant respectfully asserts that none of the prior art references teach this limitation.

Similar limitations are present in co-pending U.S. Patent Application 11/620,162 (the ‘162 Application), which is a continuation of the present application and is being examined by the same examiner. The ‘162 Application is subject to a Final Office Action. Paragraphs 16-22 of the Final Office Action rejects the claims of the ‘162 Application under 35 U.S.C. §103(a) as allegedly being obvious over various combinations of Boehm (U.S. Patent 6,661,792), Naruo (U.S. Patent 5,821,417), Ashcraft (U.S. Patent 5,513,844), Lynch (U.S. Patent 4,375,887), Gobush, and Miller (Golf Digest article 2002). At issue in the prosecution of the ‘162 Application is whether references such as Boehm, Narou, and Gobush teach, suggest, or disclose, alone or in combination, the fitting systems and methods disclosed in the present application. Specifically, whether Boehm and Narou, the base references used in the rejections included in the

Final Office Action, teach optimizing the launch angle, velocity, and spin rate to achieve maximum distance and control. Since many of these same references are cited in this Action and it is likely that the current amendments will lead to a similar rejection, Applicant is including a response to the rejections contained in the Final Office Action in the '162 Application in order to speed prosecution.

First, Applicant asserts that Naruo is not prior art because Naruo has a priority date of July 4, 2002, while the present application has a priority date of January 18, 2002, via a claim of priority as a Continuation-In-Part (CIP) to U.S. Patent Application 10/053,797 (the '797 Application). The '797 Application, in particular figures 8 and 9 in view of the rest of the disclosure of the '797 Application, provides support for the methods claimed in the present application. At the very least, the '797 Application would be evidence that the inventor of the present application conceived of his invention prior to the priority date of Naruo.

Regardless, however, neither Boehm or Naruo, alone or in combination, teach a fitting method that optimizes the launch angle, velocity, and spin rate relative to each other using non-linear relationships between these parameters. The relationship between the launch data parameters has to be non-linear, because as noted in the present application two golfer's can have the exact same swing speed, e.g., 100mph, but can require very different equipment. (See paragraph 4 of the present application). But using conventional fitting techniques, such as those disclosed in Boehm and Naruo, the golfer's would be fit with a club having the same or similar parameters. This is because, as Boehm notes multiple times, the fitting process described therein starts with acquiring the velocity, or club head speed (See figure 1 of Boehm), and then uses "direct linear

relationships” to select a launch angle and a spin rate based on the swing speed. (See, col. 6, lines 43-44, 45-46, 63-65, and 65-66).

Figures 2-6 illustrate the “direct linear relationships” relied on in Boehm. Thus, for example, if one were to implement the methods disclosed in Boehm, then a higher swing speed would result in the selection of a lower loft. (See figure 2 of Boehm). In other words, Boehm uses a linear, inverse relationship between the velocity and the launch angle. Similarly, as illustrated in figure 4 of Boehm, a negative, inverse relationship between the spin rate and velocity is also used. Thus a golfer with a high swing speed, like 100mph, would be fit with a lower lofted club and a higher spinning ball. But as the example in paragraph 4 of the present application illustrates, one golfer with a 100mph swing speed may produce a launch angle of 15 degrees, while another golfer with the same swing speed produces a launch angle of 3 degrees. Fitting this later golfer with a low lofted club would be a mistake. Also, one of the golfer’s may produce a spin rate of 5000rpm, while the other produces a spin rate of 2500rpm. Fitting the first golfer with a high spinning ball would also be a mistake.

The only way to accurately fit a golfer is to use non-linear relationships applied to iterative sets of data as described and claimed in the present application.

With respect to Naruo, it should be noted that Naruo is not concerned with fitting. Naruo claims to teach methods of constructing a club head that will produce maximum distance regardless of the swing speed. (See paragraph 17). In other words, any golfer should be able to use the club and produce the maximum distance, which is actually the opposite of fitting. But Naruo acknowledges the inverse, linear relationships used in conventional fitting procedures, such as those disclosed in Boehm, in paragraphs 3 and 4.

Naruo, like Boehm, also states that once the velocity is known, then the correct launch angle and spin rate can be determined. It should be noted that Naruo, like Boehm is only concerned with maximizing distance. (See, for example, paragraph 1 and 15 of Naruo).

Thus, Naruo does not teach a fitting method and is actually cumulative of Boehm. Moreover, Naruo seems to admit that the equations shown therein do not work. (See the discussion of figure 6). Accordingly, even if Naruo were prior art, it does not appear to teach or suggest, alone or in combination with Boehm or any of the other cited art, a method for fitting a golfer that uses non-linear relationships between the launch angle, velocity, and spin rate as claimed, e.g., in claim 1.

Both Boehm and Naruo teach that the launch angle and spin rate can be determined using linear relationships once the velocity is known. In claim 4 optimizing the launch angle, velocity, and spin rate relative to each other comprises selecting a launch angle based on a combination of velocity and spin rate, and in claim 5 optimizing the launch angle, velocity, and spin rate relative to each other comprises selecting a spin rate based on a combination of velocity and launch angle. Rather, the velocity is used in Boehm to select a launch angle and separately to select a spin rate. (See figures 3 and 4). Neither Boehm or Naruo teach or suggest these limitations. In fact Boehm is very clear (see figure 1) that the spin rate and launch angle are chosen based on the velocity. Thus, Boehm certainly does not teach the limitation of claim 6: “optimizing the launch angle, velocity, and spin rate relative to each other comprises selecting a velocity based on a combination of launch angle and spin rate.”

In the first full paragraph of column 6, Boehm does list several factors that impact the launch angle and spin rate. The paragraph concludes with the statement that “all of

these factors are [preferably] considered in order to maximize distance.” But Boehm does not indicate how one would “consider” these factors in order to “maximize distance.” This paragraph has been relied on in previous office actions as teaching matching velocity with a combination of launch angle and spin rate; however, matching based on the “direct linear relationships” disclosed in the figures is the only matching disclosed in Boehm. Table 1 in Boehm does list measured and optimum swing speeds, launch angles, and spin rates for a low, medium, and high swing speed, but there is no suggestion that the optimum data is anything more than data taken from the figures of Boehm based on the swing speed. In other words, table 1 does not indicate that a matching of swing speed to a combination of launch angle and spin rate has taken place. Rather, it seems to simply contain the results of the “direct linear relationship” between the swing speed and the launch angle and the swing speed and the spin rate disclosed in the figures of Boehm.

In order to achieve an optimal fitting as described in the present application, the fitting process must use non-linear relationships, because as noted two golfers with the same swing speed can produce vastly different launch angles and spin rates. Thus, if a simple direct linear relationship is used, then an optimum fitting will be hard to achieve. Thus, the fitting algorithms described in the present application are based on more than just swing speed, or velocity. For example, if two golfers have the same swing speed, but one produces much more back spin, then the algorithm can account for that and suggest a lower spinning ball, whereas the algorithm may suggest a higher spinning ball for the other golfer.

In addition, the process is iterative. Because as mentioned in the present application (see, e.g., paragraph 55), two different clubs with the same, e.g., flex range, can have entirely different performance characteristics. This is due to a large number of club characteristics or parameters that effect launch conditions. Thus, if a golfer is simply fit with a shaft flex, as in Boehm, the golfer may never obtain optimum ball flight. For example, the golfer may need a stiffer shaft, but a softer tip. If that golfer is given a club with a shaft that has the right flex, but a stiff tip, then the golfer will not obtain optimum performance.

But simply changing the tip stiffness may effect the velocity, launch angle, spin or some combination thereof, which could change everything. In other words, the assumption or data underlying the original fitting conclusion may change and warrant a different conclusion. Thus, in the embodiments disclosed and claimed in the present application, an iterative process is used to examine a plurality of club parameter changes and to perform the non-linear analysis in order to arrive at the optimum ball flight. (See figure 3).

Put simply, the art of record in the '162 Application do not teach an iterative, non-linear fitting process.

Paragraph 12 of the Action rejects claim 2-4 under 35 U.S.C. 103(a) as allegedly being unpatentable over Anderson in view of Gobush in further view of Evans in still further view of Sayers (U.S. Patent No. 4,059,270). Applicants traverse this rejection because claims 2-4 ultimately depends from amended claim 1 and is therefore allowable for at least the same reasons as amended claim 1, unless Sayers makes up for the

deficiencies of Anderson, Gobush and Evans which it does not. Accordingly, Applicants respectfully request withdrawal of the rejection as to claims 2-4.

Paragraph 13 of the Action rejects claims 20-21 under 35 U.S.C. 103(a) as allegedly being unpatentable over Anderson in view of Gobush in further view of Evans in still further view of Sayers in still further view of Pelz (U.S. Patent No. 5,039,098) in still further view of Engfer (U.S. Patent No. 5,749,792). Applicants traverse this rejection because claims 20 and 21 ultimately depend from amended claim 1 and are therefore allowable for at least the same reasons as amended claim 1, unless Sayers, Pelz, and Engfer make up for the deficiencies of Anderson, Gobush and Evans which they do not. Accordingly, Applicants respectfully request withdrawal of the rejection as to claims 20-21.

Applicant also traverses the rejection, because the question is not simply whether it is known to fit a club to a golfer by selecting the various parameters mentioned, including the grip, but whether it would have been obvious to change these parameters in order to optimize the velocity, spin rate, and launch angle relative to each other in order to achieve an optimum ball flight. As the teachings of, e.g., Anderson, Gobush, Evans, Boehm, and Naruo show, or more specifically what they do not show, it was not obvious at the time the application was filed. Thus, there is no support, other than possibly hindsight, for the proposition that one of skill in the art at the time of the invention would be motivated to modify the teachings of any of the cited prior art based on Pelz and Engfer to achieve the invention as claimed in claims 20 and 21. Accordingly, Applicants respectfully request withdrawal of the rejection as to claims 20-21 for the additional reason that the reasoning included in paragraph 13 is at best based on hindsight and that

in fact there is no motivation to make the suggested modifications suggested in the Action.

Paragraphs 14 and 15 of the Action rejects claim 87 under 35 U.S.C. 103(a) as allegedly being unpatentable over Anderson in view of Gobush in further view of Evans in still further view of Boehm or Naruo in still further view of Miller. First, claim 87 depends from amended claim 1 and is therefore allowable for at least the same reasons as amended claim 1, unless Boehm and Miller make up for the deficiencies of Anderson, Gobush and Evans which they do not. Accordingly, Applicants respectfully request withdrawal of the rejection as to claim 87.

Second, claim 87 is very similar to the claims pending in the '162 Application, which were rejected over the Boehm, Naruo, and Miller. As pointed out in the response to Final Office Action in the '162 Application, Miller is not suggesting that one should be fit for clubs so that they can hit the ball with different trajectories. As Applicant previously pointed out in the '162 Application, the Miller article is talking about modifying technique. In response to Applicants arguments in the '162 Application, the Final Action admits that Miller could be talking about technique, but then disagrees stating that the most "obvious" way for one to achieve the suggested ball flight trajectories mentioned in the Miller Article is to design them into a set of clubs. But this begs the question of whether the claims are obvious and is the same as saying the claim is obvious because it is obvious. The unsupported statement in the Final Action in the '162 Application is not evidence of obviousness and cannot be used to support a *prima facie* case of obviousness.

As evidence that the Miller article is talking about technique, it should be noted that Jack Nicklaus is attributed in the article as saying most golfers on the pro tour cannot hit the ball high and that many use a low ball flight despite the fact he says a high ball flight is better. Nicklaus knows what he is talking about in this regard, and the article refers to him because he is an expert in this area. Therefore, golfers, especially pro golfers would want to hit a high ball as suggested by Nicklaus. If it was just a matter of fitting, then all pro golfers of that time, who have and had unlimited access to club makers and club fitters, would have been fit for clubs that allow them to hit the ball high, or even medium as Miller suggests. But clearly this is not the case, because the article is referring to technique and not fitting.

Second, and in fact, there is no statement related to, suggestion of, or reference to fitting in the Miller article. Even if fitting is the “most obvious way”, which it is not, to achieve the ball flights indicated, the Miller article does not indicate how one of skill in the art would modify the teachings of Boehm and Naruo to include a maximum ceiling height and to match “velocity with a combination of launch angle and spin rate determined based at least in part on . . . [a] maximum ceiling height.” Boehm and Naruo cannot be relied on in this regard, since neither of them use or include a maximum ceiling height. Nor does either of them indicate that it would be desirable to limit ball flight in this manner. Each is only concerned with maximizing distance, and in particular maximizing driver distance. (See Boehm col. 1, lines 20-21 of Boehm and paragraph 1 of Naruo). Thus, none of the cited references teaches or suggests fitting for a particular trajectory, or using a maximum ceiling height during fitting.

A point worth emphasizing: Even if the Action is correct, which it is not, that one of skill in the art would be motivated to include a maximum ceiling height in the system of Boehm or Naruo after reading Miller, there is no teaching, in any of the art of record, of how one would optimize the speed, launch angle, and spin rate relative to each other in order to match “velocity with a combination of launch angle and spin rate determined based at least in part on . . . [a] maximum ceiling height,” as claimed in the present application.

Third, the Miller article is only two short paragraphs, but in that short space, three different famous golfer’s express or are associated with three different views as to what is the optimum trajectory: Nicklaus says it is a high trajectory, Travino says it is low, and Miller says it is various degrees of medium. Thus, one of skill in the art would not have been motivated to modify the teachings of Boehm and Naruo to include a maximum ceiling height based on Miller, because it is not even clear from the Miller article that it is necessary. Moreover, none of them are associated with the suggestion that one should be fit with clubs that achieve any particular trajectory.

The Final Office Action in the ‘162 Application also responds stating that the Examiner is of the opinion that designing a set of clubs that prevent a high ball flight would be the most likely way one of skill in the art would recommend in order to minimize the height of the ball trajectory. First, this is not evidence. At best it is Examiner’s notice, which is rarely appropriate. (See MPEP §2144.03(A)). Second, as noted, it is not even clear from Miller that one would want to “minimize trajectory.”

The Final Office Action in the ‘162 Application also responds, “[w]hy would a golfer want to use anything else than a normal stance and a normal swing in having a set

of clubs which prevents super high ball flight set which Miller expresses concern over?" This statement again begs the question, i.e., the question is not why would a golfer want to do anything else? The question is whether the Miller article suggests that a maximum ceiling height should be used during fitting, and even more particularly should that maximum ceiling height be used for "... matching velocity with a combination of launch angle and spin rate determined based at least in part on the maximum ceiling height." The clear answer is the Miller article makes no such suggestion, nor can one be gleaned from the short two paragraphs that are the Miller article.

As noted above, what the Action fails to consider is that club makers at the time of the invention operated under a narrow set of assumptions about how clubs work and what the best combination of parameters would be: namely, that there was a fixed relationship between the speed at which a golfer swung a club and the optimum launch angle and spin rates. This fixed relationship is clearly evidenced in the figures of Boehm. For example, figure 3 of Boehm clearly illustrates the conventional view of the time that as the swing speed gets slower the loft of the driver, which correlates with the launch angle, should go higher and vice versa, i.e., the loft and speed are inversely proportional. This inverse relationship that was the standard for the time is also noted in paragraph 3 of Naruo. The equations of Naruo also define an inverse relationship between club head speed  $V_B$  and launch angle  $\alpha$ .

Fitting for clubs other than the driver was based on even more narrow assumptions than those mentioned above, which really only apply to the driver. For example, fitting for irons has historically been based on one simple assumption: the better

the golfer, the stiffer the shaft. That is it. Club makers/fitters conventionally determine swing speed and fit the golfer with a shaft for their irons.

At the time of the invention, club makers would create a club based on these narrow assumptions and it was up to the player to modify their technique to improve performance. For example, they could modify their trajectories through technique as discussed in Miller. In short, prior to the invention as claimed in the present application, a golfer, even a pro golfer could not be fit as suggested in the Action, because such fitting just wasn't available. This is likely why fitting was not mentioned in the Miller article, though it easily could have been. Accordingly, there is no support for the allegation that one of skill in the art at the time of the invention would read the Miller article and be motivated to modify the teachings of Boehm and Naruo to include various maximum ceiling heights for different ranges of clubs in a fitting process.

Further, as directed by MPEP §2143.01(V), “[i]f proposed modification would render the prior art invention being modified unsatisfactory for its intended purpose, then there is no suggestion or motivation to make the proposed modification. *In re Gordon*, 773 F.2d 900, 221 USPQ 1125 (Fed. Cir. 1984).” Accordingly, Applicant respectfully asserts that since Boehm and Naruo are explicitly directed to maximizing – not just increasing but maximizing – distance (see Col. 1, lines 20-21 of Boehm and paragraph 1 of Naruo), then any proposed modification that would result in less than maximum distance would render Boehm or Naruo unsatisfactory for its intended purpose. Here, the Office Action proposes modifying Boehm or Naruo with the teachings of Miller to provide “selecting a maximum ceiling height for golf ball trajectory, and wherein matching the velocity with a combination of launch angle and spin rate comprises

matching velocity with a combination of launch angle and spin rate determined based at least in part on the maximum ceiling height.” However, since using a maximum ceiling height in this manner can often will lead to less than maximum distance, there is no suggestion or motivation to make the proposed modification to Boehm or Naruo based upon the teachings of Miller.

Accordingly, Applicants respectfully request withdrawal of the rejection as to claim 87 or the additional reason that the reasoning included in paragraphs 14 and 15 are at best based on hindsight and that in fact there is no motivation to make the suggested modifications suggested in the Action.

**Claim Amendments:**

As noted above, Applicant has amended the claims above to include limitations for the second part of the claimed process that more closely resemble the limitations included in the claims of the ‘162 Application. These limitations are fully supported by the original disclosure and add no new matter. For example, obtaining launch data, changing club parameters, and obtaining new launch data is clearly describe with respect to figure 3. Accordingly, the only limitation that can even be question in this regard is: “in the launch module, using the received launch data to optimize a launch angle, velocity, and spin rate relative to each other based on non-linear relationships between the launch angle, velocity, and spin rate . . . .”

The specification does not explicitly include the term “non-linear relationship:” however, one of skill in the art at the time of the invention would clearly understand the systems and methods described in the present application as including and using non-linear relationships between the launch angle, velocity, and spin rate. For example,

paragraphs 3 and 4 of the present application are clearly referring to conventional techniques such as those described in Boehm and Naruo, which use “direct linear relationships” based on the swing speed, or velocity to then select other parameters such as the launch angle and spin rate. Paragraph 4 then goes on to point out that the problem with these linear techniques is that they do not take into account the fact that two different golfer’s can produce vastly different launch conditions, with respect to launch angle and spin rate, even though they have the same swing speed. This clearly suggest that some non-linear relationship must be used to account for these differences.

The specification goes on to note, in paragraph 55 that two different shafts with the same flex can produce vastly different results depending on other parameters all of which effect the velocity, launch angle, and spin rate, which suggests that simple linear relationships between these three will not suffice. Even more to the point, in paragraph 56, the specification notes that in certain instances, the spin rate may need to be increased to achieve greater distance, while other it may need to be decreased. While the decision on which way to go with the spin rate is not independent of the velocity and launch angle, it is clear that simple linear relationships will not suffice and that all three as well as the relationship therebetween need to be considered and then a selection made.

Thus, in certain instances, a higher spin rate will be selected and in certain others a lower spin rate will be selected, even where, e.g., the velocity is the same. For example, returning the example of paragraph 4, where the two example golfers both have a swing speed of 100mph, a lower launch angle would likely be selected for one, e.g., by the optimizer referred to in paragraph 86, whereas a higher launch angle would likely be selected for the other. Similarly, a lower back spin would likely be selected for one,

while a higher back spin would likely be selected for the other. In other words, the system is not operating off of linear relationships but rather is operating based on more complex relationships.

Moreover, the relationships are not simple relationships that map a velocity onto a launch angle or a spin rate as disclosed in Boehm and referred to in Naruo. The launch angle, velocity, and spin rate are constantly being adjusted relative to each other, which leads to the non-linearity.

Other amendments have also been made to the claims in order to clarify the subject matter and maintain consistency throughout the claims.

## CONCLUSION

Applicants believe the Reply is now in compliance and respectfully requests that the Reply be entered. Based on the above amendments and remarks, Applicants believe that the claims are in condition for allowance and such is respectfully requested. Applicants believe that no additional fees are necessitated by this response. The Commissioner is hereby authorized to charge any additional fees required by this response to our Deposit Account No. **502075** (Attorney Docket No. 116540-1102CP).

Respectfully Submitted,

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